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EXAMINER	
YUN, EUGENE	
ART UNIT	**PAPER NUMBER**
2682	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/736,294	Applicant(s) DEMIR ET AL.	
	Examiner Eugene Yun	Art Unit 2682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,6-15,17,19-26,34 and 36-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6-15,17,19-26,34 and 36-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 44-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Mohindra et al. (US 6,169,463).

Referring to Claim 44, Mohindra teaches a digital baseband (DBB) transmitter comprising:

An analog radio transmitter including a modulator prone to a carrier leakage deficiency (see col. 1, lines 43-55); and

A digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component (see col. 1, lines 60-67), wherein a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values (see col. 2, lines 7-42).

Referring to Claim 46, Mohindra teaches a wireless transmit/receive unit (WTRU) comprising:

An analog radio transmitter including a modulator prone to a carrier leakage deficiency (see col. 1, lines 43-55); and

A digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component (see col. 1, lines 60-67), wherein a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values (see col. 2, lines 7-42).

Referring to Claim 48, Mohindra teaches an integrated circuit (IC) for processing signals input to an analog radio transmitter including a modulator prone to a carrier leakage deficiency (see col. 1, lines 43-55), the IC comprising:

A digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component (see col. 1, lines 60-67), wherein a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values (see col. 2, lines 7-42); and

At least one digital to analog converter (DAC) for interfacing the digital DC offset compensation module with the analog radio transmitter (see col. 1, lines 60-63).

Referring to Claims 45, 47, and 49, Mohindra also teaches a modulator having a local oscillator (LO) frequency at which the minimum detected readings are determined (see col. 2, lines 1-3).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, 7, 8, 14, 15, 20, 21, 34, 37, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mo et al. (US 2004/0219884) in view of Kossor (US 6,759,902).

Referring to Claim 1, Mo teaches a digital baseband (DBB) transmitter comprising:

an analog radio transmitter 16 (fig. 1);

a plurality of digital compensation modules 40 and 44 (fig. 1); and

at least one controller in communication with the analog radio transmitter and each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter (see paragraph [0026]).

Mo does not teach a temperature sensor and a memory for storing a plurality of look up tables (LUTs) wherein the temperature sensor monitors a temperature reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the temperature reading monitored by the temperature sensor. Kossor teaches a temperature sensor 234 (fig. 2) and a memory for storing a plurality of look up tables (LUTs) 238 (fig. 2) wherein the temperature sensor monitors a temperature reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the temperature reading monitored by the temperature sensor (see col. 3, lines 40-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Kossor to said device of Mo in order to provide a simpler and less expensive method of correcting RF parameter deficiencies.

Referring to Claim 14, Mo teaches a wireless transmit/receive unit (WTRU) comprising:

An analog radio transmitter 16 (fig. 1);

a plurality of digital compensation modules 40 and 44 (fig. 1); and

at least one controller in communication with the analog radio transmitter and each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter (see paragraph [0026]).

Mo does not teach a temperature sensor and a memory for storing a plurality of look up tables (LUTs) wherein the temperature sensor monitors a temperature reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the temperature reading monitored by the temperature sensor. Kossor teaches a temperature sensor 234 (fig. 2) and a memory for storing a plurality of look up tables (LUTs) 238 (fig. 2) wherein the temperature sensor monitors a temperature reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the temperature reading monitored by the temperature sensor (see col. 3, lines 40-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Kossor to said device of Mo in order to provide a simpler and less expensive method of correcting RF parameter deficiencies.

Referring to Claim 34, Mo teaches an integrated circuit (IC) for processing signals input to an analog radio transmitter, the IC comprising:

a plurality of digital compensation modules 40 and 44 (fig. 1); and

at least one controller in communication with each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter (see paragraph [0026]).

Mo does not teach a temperature sensor and a memory for storing a plurality of look up tables (LUTs) wherein the temperature sensor monitors a temperature reading

associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the temperature reading monitored by the temperature sensor. Kossor teaches a temperature sensor 234 (fig. 2) and a memory for storing a plurality of look up tables (LUTs) 238 (fig. 2) wherein the temperature sensor monitors a temperature reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the temperature reading monitored by the temperature sensor (see col. 3, lines 40-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Kossor to said device of Mo in order to provide a simpler and less expensive method of correcting RF parameter deficiencies.

Referring to Claims 2 and 15, Mo also teaches

(i) a power amplifier 15 (fig. 1);

(ii) a modulator 216 (fig. 2); and

(iii) a power detector 228 (fig. 2).

Referring to Claims 7, 20, and 37, Mo also teaches a digital pre-distortion compensation module having two signal inputs including an in-phase (I) input and a quadrature (Q) input, the DBB transmitter further comprising:

a low pass filter (LPF) 128 and 130 (fig. 2) coupled to each of the I and Q inputs of the digital pre-distortion compensation module; and

at least one digital to analog converter (DAC) for interfacing the digital compensation modules with the analog radio transmitter 46a and 46b (fig. 1).

Referring to Claims 8, 21, and 38, Mo also teaches each LPF is a root-raised cosine (RRC) filter (see paragraph [0040]).

5. Claims 9, 10, 22, 23, 39, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mo and Kossor and further in view of Mohindra.

Referring to Claims 9, 22, and 39, Mo does not teach the digital compensation modules include a digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to a carrier leakage deficiency, a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values. Mohindra teaches a digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component (see col. 1, lines 60-67), the analog radio transmitter includes a modulator prone to a carrier leakage deficiency (see col. 1, lines 43-55), a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on

the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values (see col. 2, lines 7-42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Mohindra to the modified device of Mo and Kossor in order to better correct RF parameter deficiencies by considering more conditions.

Referring to Claims 10, 23, and 40, Mohindra also teaches a modulator having a local oscillator (LO) frequency at which the minimum detected readings are determined (see col. 2, lines 1-3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Mohindra to the modified device of Mo and Kossor in order to better correct RF parameter deficiencies by considering more conditions.

6. Claims 6, 11-13, 19, 24-26, 36, and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mo and Kossor and further in view of Wright et al. (US 6,313,703).

Referring to Claims 6, 19, and 36, Wright also teaches a digital pre-distortion compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the power amplifier is prone to a linearity deficiency, and the digital pre-distortion compensation module is configured to distort the phase and amplitude of the I and Q signal components based on gain and

phase characteristics of the power amplifier stored in the selected LUT, such that the power amplifier generates a linear response rather than a distorted response (see col. 16, lines 55-67 and col. 17, lines 1-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Wright to the modified device of Mo and Kossor in order to better correct RF parameter deficiencies by considering more conditions.

Referring to Claims 11, 24, and 41, Wright also teaches a digital amplitude imbalance compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to an amplitude balance deficiency, and the digital amplitude imbalance compensation module is configured to adjust the power level of one of the I and Q signal components, such that the power level of each of the I and Q signal components is the same (see col. 25, lines 11-21). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Wright to the modified device of Mo and Kossor in order to better correct RF parameter deficiencies by considering more conditions.

Referring to Claims 12, 25, and 42, Wright also teaches a digital phase imbalance compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to a phase balance deficiency, and the digital phase imbalance compensation module is configured to adjust the phase of the I and Q signal components, such that the phase of each of the I and Q signal components are

orthogonal to each other (see col. 25, lines 21-34). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Wright to the modified device of Mo and Kossor in order to better correct RF parameter deficiencies by considering more conditions.

Referring to Claims 13, 26, and 43, Wright also teaches a modem for generating in-phase (I) and quadrature (Q) signal components which are input to each of the digital compensation modules, the DAC and the analog radio transmitter (see col. 8, lines 10-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Wright to the modified device of Mo and Kossor in order to better correct RF parameter deficiencies by considering more conditions.

7. Claims 50-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mo in view of Mahowald et al. (US 6,836,493).

Referring to Claim 50, Mo teaches a digital baseband (DBB) transmitter comprising:

an analog radio transmitter 16 (fig. 1);

a plurality of digital compensation modules 40 and 44 (fig. 1); and

at least one controller in communication with the analog radio transmitter and each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter (see paragraph [0026]).

Mo does not teach a bias current sensor and a memory for storing a plurality of look up tables (LUTs) wherein the bias current sensor monitors a bias current reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the bias current reading monitored by the bias current sensor. Mahowald teaches a bias current sensor 25 (fig. 2) and a memory for storing a plurality of look up tables (LUTs) (see col. 10, lines 55-64) wherein the bias current sensor monitors a bias current reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the bias current reading monitored by the bias current sensor (see col. 10, lines 55-64 and col. 14, lines 32-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Mahowald to said device of Mo in order to better optimize performance in a transmitter after correcting RF parameter deficiencies.

Referring to Claim 53, Mo teaches a wireless transmit/receive unit (WTRU) comprising:

An analog radio transmitter 16 (fig. 1);

a plurality of digital compensation modules 40 and 44 (fig. 1); and

at least one controller in communication with the analog radio transmitter and each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur

in the analog radio transmitter (see paragraph [0026]).

Mo does not teach a bias current sensor and a memory for storing a plurality of look up tables (LUTs) wherein the bias current sensor monitors a bias current reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the bias current reading monitored by the bias current sensor. Mahowald teaches a bias current sensor 25 (fig. 2) and a memory for storing a plurality of look up tables (LUTs) (see col. 10, lines 55-64) wherein the bias current sensor monitors a bias current reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the bias current reading monitored by the bias current sensor (see col. 10, lines 55-64 and col. 14, lines 32-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Mahowald to said device of Mo in order to better optimize performance in a transmitter after correcting RF parameter deficiencies.

Referring to Claims 51 and 54, Mo also teaches

(i) a power amplifier 15 (fig. 1);

(ii) a modulator 216 (fig. 2); and

(iii) a power detector 228 (fig. 2).

Referring to Claims 52 and 55, Mahowold also teaches a temperature sensor for monitoring a temperature reading associated with the analog radio transmitter, and at

least one of the digital compensation modules is activated in response to the temperature sensor (see col. 4, lines 54-56). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Mahowald to said device of Mo in order to better optimize performance in a transmitter after correcting RF parameter deficiencies.

Referring to Claim 56, Mo teaches an integrated circuit (IC) for processing signals input to an analog radio transmitter, the IC comprising:

a plurality of digital compensation modules 40 and 44 (fig. 1); and

at least one controller in communication with each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter (see paragraph [0026]). Mo does not teach a bias current sensor and a memory for storing a plurality of look up tables (LUTs) wherein the bias current sensor monitors a bias current reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the bias current reading monitored by the bias current sensor. Mahowald teaches a bias current sensor 25 (fig. 2) and a memory for storing a plurality of look up tables (LUTs) (see col. 10, lines 55-64) wherein the bias current sensor monitors a bias current reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the bias current reading monitored by the bias current sensor (see col. 10, lines 55-64 and col.

14, lines 32-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Mahowald to said device of Mo in order to better optimize performance in a transmitter after correcting RF parameter deficiencies.

8. Claims 4 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mo and Kossor and further in view of Mahowold.

Referring to Claims 4 and 17, the combination of Mo and Kossor does not teach a bias current sensor for monitoring a bias current reading associated with the analog radio transmitter, and at least one of the digital compensation modules is activated in response to the bias current sensor. Mahowold teaches a bias current sensor for monitoring a bias current reading associated with the analog radio transmitter, and at least one of the digital compensation modules is activated in response to the bias current sensor (see col. 10, lines 55-64). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Mahowold to the modified device of Mo and Kossor in order to better optimize performance in a transmitter after correcting RF parameter deficiencies.

Response to Arguments

9. Applicant's arguments with respect to claims 1, 2, 4, 6-15, 17, 19-26, 34, and 36-56 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Yun whose telephone number is (571) 272-7860. The examiner can normally be reached on 9:00am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quochien Vuong can be reached on (571)272-7902. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EY
Eugene Yun
Examiner
Art Unit 2682

MARCEAU MILORD
PRIMARY EXAMINER